

CLAIMS:

1. A use-authorization device for security-related applications, in particular access control to secure areas or for securing vehicles, with
 - a user-end key unit for generating consecutive, alternating user code information which has a sequence of consecutive function values $v_{i+1} = F(v_i, \text{const})$ for $i = 0, \dots, N$ through the repeated use of a one-way function $F(v_i, \text{const})$, which function values are used in inverse order to the sequence formation to create the consecutive user code information; and
 - an application-end processing unit for determining actual authorization information which is dependent upon the user code information received from the key unit
- 10 and for performing a use-authorization checking process by comparing this actual authorization information with the application-end desired authorization information, as well as for generating use-release information depending on the result of the comparison, wherein the desired authorization information has a function value v_i which has been transferred from the user code information which had been processed during the previous positive use-
 - 15 authorization operation;
 - characterized in that
 - there is a certain number of levels G provided from which a certain number of iterative function value calculations can be performed in each level by means of the one-way function $F(v_i, \text{const})$, and
 - 20 - there are $G = \lceil L(N)/b \rceil$ levels, wherein N is the starting value, $L(N)$ is the number of bits required for representing N in the dual system and b is the basis.
2. A device as claimed in claim 1, characterized in that there is a support point $s(i)$ where $i = (1, \dots, G)$ provided for each level.
- 25 3. A device as claimed in claim 2, characterized in that the values for the support points $s(i)$ are determined from the equation

$$s(i) = N - \sum_{j=1}^i (2^b)^j$$

4. A device as claimed in any one of claims 2 or 3, characterized in that no function values can be calculated for support points with a negative index.

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5. A device as claimed in at least one of claims 2 to 4, characterized in that the parameter b is adapted for a specified number of support points in such a way that the function value calculations per use authorization are minimized.

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6. A device as claimed in at least one of claims 2 to 5, characterized in that, starting from the current support point $s(i)$, there should be a certain number of function values calculated in each level in descending order and saved as intermediate values.

7. A device as claimed in claim 2, characterized in that an intermediate value for the support point in a level should be reset successively in this level once this intermediate value, as a new support point, has been transferred to the next level down.

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8. A device as claimed in at least one of the preceding claims, characterized in that the starting value is $N = (2^b)^G$.

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9. A device as claimed in at least one of claims 1 to 7, characterized in that the starting value is $N \in \{(2^b)^{G-1}, \dots, (2^b)^G - 1\}$.

10. A device as claimed in at least one of the preceding claims, characterized in that there were several buffers provided for saving intermediate values which are calculated from the function values.

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11. A device as claimed in claim 10, characterized in that the buffers are FIFO memories.